

**Friends of the Earth (Bluewater Team); American Lung Association, California;  
The Center for Energy Efficiency and Renewable Technologies (CEERT);  
Coalition for Clean Air; Environmental Defense; Sierra Club California**

January 20, 2007

Hon. Robert Sawyer, Ph.D.  
Chair  
California Air Resources Board  
1001 "I" Street  
Sacramento, CA 95818

Dear Chairman Sawyer:

**Re: Global Warming Solutions Act Early Action Measures**

We write today to urge you to enact early action items under the Global Warming Solutions Act that will reduce global warming pollution from ocean-going vessels in California.

Ocean-going vessels contribute to climate change through emissions from combustion of marine fuels. New research produced for the California Air Resources Board by Jim Corbett of the University of Delaware estimated that ocean-going vessels transiting North American waters that call on U.S., Canadian and Mexican ports use 1.5 million metric tons of marine fuel per year and generate 4.8 million metric tons of carbon dioxide emissions.<sup>1</sup> His work found that CO<sub>2</sub> emissions in the shipping corridor along the West Coast are "very high" when analyzing the entire freight movement network.

In California, ARB estimates that CO<sub>2</sub> emissions from ocean-going ships will grow from 8,000 tons per day in 2004 to 18,000 tons per day by 2010, more than doubling in less than a decade.<sup>2</sup>

Also, because these ships generally burn bunker fuel, or the bottom of the barrel of the oil refining process, they produce the largest volume of criteria air pollutants per ton of fuel burned compared to other goods movement modes.<sup>3</sup> The Global Warming Solutions Act (AB 32) presents an ideal opportunity to combine the reduction of greenhouse gas emissions from these vessels with a significant reduction in criteria pollutants.

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<sup>1</sup> Estimation, Validation, and Forecasts of Regional Commercial Marine Vessel Inventories, Tasks 3 and 4: Forecast Inventories for 2010 and 2020, James J. Corbett, University of Delaware, 8 December 2006, posted at <http://www.arb.ca.gov/research/seca/jctask34.pdf>

<sup>2</sup> Appendix D, Emissions Estimation Methodology for Ocean-Going Vessels, Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Regulation for Auxiliary Diesel Engines and Diesel Electric Engines Operated on Ocean-Going Vessels, Stationary Source Division, Emissions Assessment Branch, October 2005.

<sup>3</sup> Emissions from Ships, Corbett and Fischbeck, Science 31 October 1997: 823

A report on greenhouse gases from the International Maritime Organization (IMO) published in 2000 identified a number of operational and technical measures that could reduce emissions from ships.<sup>4</sup> The most promising measures were slowing speeds, switching fuels, and improving ship and engine design. Unfortunately, no action to date has been taken at the international level to reduce GHG emissions from ships.

AB 32 requires ARB to approve a list of early action measures that can be adopted and enforced by 2010. Securing greenhouse gas reductions in the shipping sector is important for achieving the statewide pollution limits established by AB 32, as well as the Governor's target of an 80 percent reduction in global warming pollution by 2050 relative to 1990 levels. In order to reduce GHG emissions from ships in the short term, while also reducing criteria air pollutants, we recommend that ARB consider: 1) mandating ship speed reductions in all California coastal waters; 2) mandating use of marine distillate fuels in main engines; 3) demonstrating use of shoreside generators as a bridge to electrical hook-up; and 4) a green ship incentive program. Below we briefly discuss each of these measures.

### **1. Mandatory ship speed reductions in all California coastal waters**

By reducing speeds by 10 percent, ships can reduce CO<sub>2</sub> emissions by 23 percent, according to the 2000 IMO report. Extending the current speed reduction program already in place in Southern California farther out to sea, and to Northern California ports and along the coast, would achieve immediate additional reductions in GHGs. ARB is already considering this approach to reduce diesel emissions as part of the Goods Movement Emissions Reduction Program, so expediting this measure would provide positive results for both GHG and air pollution.

### **2. Mandating use of marine distillate fuels in main engines**

By switching from bunker fuels to marine distillate fuels, ships can achieve a 4 to 5 percent reduction in greenhouse gases, according to the IMO report. ARB is already planning to develop a rule to require use of marine distillate fuels in main engines. Expediting this rule would reduce GHGs along with criteria air pollutants. The contribution of ship engines to formation of Nitrous Oxide, a greenhouse gas, should also be quantified, as this emission will also be reduced. In addition, at a minimum, ARB's main engine fuel regulation for ocean going vessels should harmonize the sulfur content of marine fuels for auxiliary engines.

### **3. Demonstrate use of shoreside generators as bridge to electrical hook-up**

Hooking a ship up to the shoreside electrical grid reduces greenhouse gases by about 50 percent.<sup>5</sup> To date, a number of ship terminals have employed this technology in California. Regional port plans have called for an increased use of dockside power

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<sup>4</sup> Study of Greenhouse Gas Emissions from Ships, International Maritime Organization, 2000

<sup>5</sup> Service Contract on Ship Emissions, Task 2A – shoreside electricity, European Commission, Entec, 2005

and ARB has begun rule development for a statewide regulation. ARB should prioritize this regulation in 2007.

Although installing dockside power will require time, other promising technologies in the short term could complement dockside power from the grid and bridge infrastructure gaps. For example, we propose demonstration of mobile shoreside generators that would provide electrical power to ships on demand without engaging the power grid or requiring ship modification. Such technology for cold ironing is being proposed by an engineering firm under the brand DFMV Cold-Ironing.<sup>6</sup>

A dual-frequency multi-voltage generator equipped with BACT and powered by LPG or LNG can immediately provide up to 2 MW of electrical power. Although accurate quantification is still needed, we estimate that this would likely reduce GHG emissions in the range of 10 to 20 percent, (based on switching from burning marine distillate in auxiliary engines to combustion of LPG or LNG for hoteling).

With shoreside power, criteria air pollutants would also be reduced by more than 90 percent compared to use of bunker fuels. These reductions should be calculated in comparison to use of marine distillate.

Another option for shoreside power is the use of stationary fuel cells. They can run on NG/PG without producing any criteria pollutants. This option is in fact already being investigated for use at California ports.

#### **4. Green Ship Incentive Program**

Ships can achieve 5 to 30 percent reductions through ship, hull, propeller, and engine design. Although these changes in ship design are not easily implemented, California can promote them by providing reductions in port fees or other revenue neutral financial incentives to encourage such changes to ships calling on California ports. A green ship incentive program could be an important way for the state to gain these important additional GHG reductions from ships.

Thank you for accepting and considering these comments. We look forward to working with you on the early action plan and other AB 32 implementation measures.

Sincerely,

Danielle Fugere, Friends of the Earth Bluewater Team

Bonnie Holmes-Gen, American Lung Association of California

John Shears, The Center for Energy Efficiency and Renewable Technologies

Tom Plenys, Coalition for Clean Air

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<sup>6</sup> Wittmar DFMV Cold Ironing, Wittmar Engineering

Rafael Aguilera, Environmental Defense

Bill Magavern, Sierra Club California

cc:

Hon. Linda Adams  
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